

detail as to the actual government of the Natural History Museum by the Trustees of the British Museum during the last twelve years—whether good or bad in their tendency and result—is the late Director of the Natural History Departments. He is in frequent personal relations with Sir Archibald Geikie, but has never been consulted or questioned in any way whatever by that gentleman during his “careful investigation” of the utility or inutility of the present relations of the Trustees of the British Museum to the Natural History Museum.

I am able to state, categorically, that Sir Archibald's opinion is not based upon a knowledge of the facts, and that he has not (for reasons perhaps known to the Speaker and to himself, but not to me) taken the obvious means of ascertaining the facts—since I am the late Director in question. I have always maintained very friendly relations with Sir Archibald and should have been quite willing to assist him in his inquiry. He has not, however, approached me on the subject, and has not received either from me or from others authorised by me any statement on the matter. It will, I think, be obvious to your readers that no one, not even a member of the committee itself, which varies in consequence of absences, replacements by death, inattention, and incapacity to understand the matters discussed, can have such a knowledge of the acts and tendency of the body in question as the official (in this case the Director of the Natural History Departments) who during many successive years attended every meeting (held once a month) as secretary, prepared their agenda, took the minutes of their proceedings, and conducted their correspondence. He necessarily endeavoured to obtain their support for certain lines of policy, and knows, as he alone can know, what they accepted, what they rejected, and the motives and influences at work in determining their assent and their dissent. He cannot make a full statement of his knowledge on these matters except under very special authority and guarantee of immunity. For this he asks.

E. RAY LANKESTER.

Hôtel Ritz, Paris, December 16.

### NOTES.

WE regret to announce the death, at eighty-two years of age, of M. Bouquet de la Grye, member of the Paris Academy of Sciences, and distinguished by his work in astronomy and hydrographic engineering.

THE death is announced, in his seventy-fourth year, of Prof. L. Lortet, honorary dean of the medical faculty in the University of Lyons and director of the Natural History Museum in that city. Prof. Lortet was the author of a number of original works, and also of translations of works by Prof. Tyndall and other British scientific writers.

THE juvenile lectures at the Royal Society of Arts will be delivered by Prof. Harold B. Dixon, F.R.S., on January 5 and 12, his subject being the chemistry of flame. The subject is one that lends itself to experiments, and the nature of flame, the properties of oxygen, the nature of various combinations of air and gas, will all be fully illustrated and explained.

THE Paris correspondent of the *Times* announces the death of Dr. L. Malassez, assistant director of the École des Hautes Études, and president of the French Biological Society, in his sixty-eighth year. Dr. Malassez was distinguished by his numerous works on normal and pathological histology and his research work on questions relating to blood tuberculosis and the genesis and nature of tumours.

By the assassination, on December 22, of Mr. A. M. T. Jackson, Collector of Násik, the Bombay Civil Service has lost one of its most learned members. Educated at Winchester and Brasenose College, Oxford, where he gained the Boden Sanskrit scholarship, he commenced his Indian service in 1888. He was the contributor of many papers on subjects connected with the religion, history, and ethno-

logy of western India, and he collaborated with the late Sir James Campbell in the valuable series of volumes constituting the “Bombay Gazetteer.” It was mainly owing to his researches published in the *Indian Antiquary*, Journal of the Royal Asiatic Society, and articles in the “Bombay Gazetteer” that the origin of the Rájpút tribes from the Scythian and Hun invaders was established. His untimely death removes one of the most eminent scholars in the ranks of the Indian Civil Service.

THE Research Defence Society desires to direct the attention of all Parliamentary candidates to its work. The society was founded in January, 1908, to make generally known the facts as to experiments on animals in this country, and the regulations under which they are conducted; the immense importance of such experiments to the welfare of mankind; and the great saving of human life and health which is already due to them. It is hoped that all candidates for Parliament, who may desire to acquaint themselves with these facts, will communicate with the hon. secretary, Research Defence Society, 70 Harley Street, W.

THE following appointments have been made at the National Physical Laboratory:—Dr. G. W. C. Kaye has been appointed an assistant in the metrology division. Dr. Kaye holds the degree of D.Sc. of London University, the B.A. research degree of Cambridge, and is an associate of the Royal College of Science and an associate member of the Institution of Electrical Engineers. He was formerly demonstrator in physics at the Royal College of Science, and a sub-lector in physics at Trinity College, Cambridge. Mr. Harris Booth has been appointed a junior assistant in the aéronautics division. Mr. Booth took the degree of B.A. at Cambridge, obtaining honours in mathematics and mechanical sciences. Mr. J. H. Hyde has been appointed a junior assistant in the aéronautics division. Mr. Hyde obtained in 1907 a Whitworth exhibition for engineering, and has had five years' experience at the works of the Great Eastern Railway Company.

SIR HENRY TRUEMAN WOOD, the secretary of the society, has edited a “Directory of the Royal Society of Arts,” which has been published by Messrs. George Bell and Sons at the price of 2s. The pamphlet, which runs to seventy-six pages, contains a short sketch of the society's history, an account of the trust and prize funds which it administers, a history of the examinations which it has carried on for the past fifty years, a description and pictures of its medals, lists of the Albert medallists and of past and present officials, the charter and by-laws, and other general information, including a list of the proceedings of the past session, and a financial statement for the past year. The pamphlet provides abundant evidence of the honourable part taken by the Royal Society of Arts in the improvement and development of the scientific and technical education of the country. The work of the society is, and has been, at once scientific, technical, industrial, commercial, and artistic. For many years—for it must be remembered the society was founded in 1754—it alone filled the place which is now occupied by the numerous modern scientific and technical associations, the Royal Society and the Society of Antiquaries alone being in existence when the society was inaugurated. It was the Society of Arts that first directed public attention to the national need for technical education, and by its efforts aroused the public feeling which led to the appointment of the Royal Commission of 1881. The whole of the society's work has been carried on without Government aid, or, indeed, without any endowment. It is practically

dependent entirely upon the annual subscriptions of its members. We welcome the new directory as likely to direct prominent attention to the excellent work the society is doing.

DR. FRANCIS WARD, who has been very successful in the photography of marine animals, described his methods, and showed the apparatus that he uses, at a recent lecture before the Royal Photographic Society. In a general sense, the apparatus is similar to the usual type of horizontal photomicrographic camera, but it is so hinged that the camera proper, including that portion of the base-board that carries the microscope, can be raised into a vertical position. The microscope can be easily unclamped and removed, an ordinary photographic lens screwed into the flange of the camera, and the apparatus is then ready for photographing objects in horizontal or vertical tanks, 6 inches or 8 inches square. To facilitate manipulation the camera has an internal mirror and a hood, as in ordinary "reflex" cameras, so that focussing and adjustment may be done on either the horizontal or the vertical focussing screen. It is thus possible to work rapidly, and to adjust the apparatus in a very short time to the photography of specimens natural size or smaller, up to a magnification of about two thousand diameters. These high magnifications are obtained with a high-power projecting eye-piece and the longest camera extension—about 30 inches. For low magnifications, up to about twenty-five diameters, Dr. Ward prefers Zeiss's micro-planar lenses. By the use of a small arc-lamp as made for microscopic illumination, "instantaneous" work is possible, and Dr. Ward showed, by way of illustration, a photograph of living and moving oyster spat, magnified sixty diameters, taken in the tenth of a second. One special advantage of colour photographs, as on autochrome plates, was mentioned, namely, that specimens which will only take a quickly fugitive stain can be photographed while at their best, and so a permanent record obtained.

ALCYONARIAN and madreporarian corals from the Irish coast are discussed by Miss J. Stephens, of the Dublin Museum, in "Fisheries, Ireland, Sci. Invest., 1907, No. 5 (1909)," the paper including the description by Prof. Hickson of a new species of the genus *Stachyodes*.

PICTURES of Arctic and Antarctic scenery, by Mr. F. W. Stokes, form some of the latest additions to the museums of the Brooklyn Institute. According to the December number of the *Museum News*, Mr. Stokes is absolutely the first to represent the scenery of the Antarctic in painting, while he has had but one predecessor in depicting that of the Arctic.

AMONG the additions to the Bristol Museum and Art Gallery recorded in the report for the year ending in September last are living specimens of *Polypterus* and *Protopterus* collected by the late Mr. J. S. Budgett, which have proved a source of interest to visitors. Numerous misprints of names, such as *Myopotomus*, *Procyon lator*, and *Spizoetus*, are apparent in the list of additions.

*Nature* for December opens with a memoir and portrait of Mikal Heggelund Foslie, for many years conservator of the botanical collection at Trondhjem, who died on November 9, in the fifty-fourth year of his age. Prof. Foslie, who was well known in this country, devoted special attention to the calcareous algæ, of which he described the collection brought home by the Percy Sladen expedition to the Indian Ocean. In 1892 he paid a visit to the Isle of Wight for the purpose of collecting these organisms, and he also made a trip to Ireland seven years later with the same object.

We have hitherto omitted to mention that in the October number of the *American Naturalist* Miss Dederer comes to the conclusion, from a careful study of the skull and dentition, that the South American marsupials of the genus *Coenolestes* appear to be more nearly related to the polyprotodonts than to the diprotodonts, among which they have hitherto been placed. In fact, the large pair of lower incisors, which may well be an adaptive feature, forms practically the only diprotodont character, the dentition in other respects being essentially polyprotodont.

To the *Field* of December 18 Mr. Douglas Carruthers communicates an article on the big game of Syria, Palestine, and the Sinaitic Peninsula, in regard to which our information has hitherto been defective. He adds the wild goat to the fauna of the district, and confirms Mr. Lydekker's statement as to the absence of the bubal hartebeest, the white oryx, and the addax. Particulars are given with regard to the horn-characters of *Gazella merrilli*, which is shown to be allied to *G. cuvieri* of the Atlas.

A CORRESPONDENT of the *Yorkshire Weekly Post* of December 11 directs attention to the scheduling by the Westmorland County Council of the hawfinch as a protected bird. This he regards as a grave mistake, seeing that the hawfinch is one of the most mischievous birds against which the gardener has to contend. Reference is also made to the northern extension of the British range of this species, which was formerly unknown in Yorkshire. The writer also directs attention to the danger to birds caused by the ringing system, as it seems that specimens of various species are shot in order to ascertain whether or no their legs are ringed.

IN the second and concluding part of his account of the life-history of the American toad, published in the December number of the *American Naturalist*, Mr. N. Miller asks the question why, in spite of the great fertility of the female, the numbers of the species remain practically stationary. Taking the low figure of 8000 eggs as the number in one spawn, it appears that with the exception of two, all these, as well as the whole of the eggs in the other spawns of the same female, must perish if the species remain, as appears to be the case, at the same numerical level. Various water animals, such as dragon-flies, water-beetles and water-bugs, together with their larvæ, newts, and crayfish, appear to be the chief agents in carrying on the work of destruction.

GREAT interest attaches to the description by Dr. E. L. Trouessart, in the October number of the *Annals and Magazine of Natural History*, of a new representative of the gymnuras, from Sze-chuen, for which the name *Neotetracus sinensis* is proposed. It will be remembered that until recently these remarkable Insectivora were known only by the Burmo-Malay genera *Gymnura* and *Hylomys*. A few years ago, however, a third genus, *Podogymnura*, was described on the evidence of a single specimen from Mount Abou, in the Philippines, and now comes the new Sze-chuen form, which is the smallest of all, and serves to connect the other *Gymnura* with the *Erenaceinæ*. It has, in fact, the general appearance of *Podogymnura* coupled with the dentition of a hedgehog. The genus has been named from the apparent resemblance of the lower jaw to the one from the French Miocene on which was founded the genus *Tetracus*.

IN the *Journal of Hygiene* for November (ix., No. 3) Prof. Hewlett, Mr. Villar, and Mr. Revis discuss the nature of the cellular elements present in milk. They conclude that the majority are not leucocytes, as has generally



been supposed, but are derived from the secreting epithelium of the udder. Moreover, vast numbers of these cells may occur in the milk of perfectly healthy cows. Some have considered that these cells (so-called leucocytes or pus-cells), when present in any number, indicate inflammation and suppuration of the udder, but in view of this work such a conclusion does not appear justifiable.

THE growing interest in India among Americans is shown by the fact that the *National Geographic Magazine* for November is largely devoted to a series of excellent photographs illustrating the temples, tombs, and people of the country, by Mr. W. M. Zumbro. It is unfortunate, however, that the titles of the plates and the letterpress were not submitted to the revision of someone more familiar with Indian life and architecture.

"TIDE Tables for the Eastern Coasts of Canada for the Year 1910," by Dr. W. Bell Dawson, have been issued by the Tidal and Current Survey in the Department of Marine and Fisheries, Ottawa. The tables are based upon observations obtained by means of self-registering tide-gauges kept in continuous operation, and, owing to the length of the series of observations, can lay claim to considerable accuracy. The records are reduced by the latest methods of analysis, by which the tidal constants are arrived at, and from these the tables are calculated by the Nautical Almanac Office in London. The paper also includes useful summaries of the more important results of investigations regarding the currents in various regions contained in the reports issued by the Survey; copies of these full reports, illustrated by charts and plates, may be had on application to the department.

A REPORT on the rainfall of the Exe Valley, by Dr. H. R. Mill, forming part of the report of progress in the investigation of rivers, by Dr. A. Strahan and others, is contained in the *Geographical Journal* for December. Owing to the scarcity of long records, Dr. Mill found it necessary to construct maps for four decades between 1868 and 1907 from the data which are summarised in the tables, and to combine these four maps into one of forty years' average by a somewhat laborious process, fully explained in the paper. This map shows that the heaviest rainfall occurs on Dartmoor, where a wide area has more than 70 inches per annum, but that this amount diminishes rapidly in all directions. The general rainfall of the whole of the Exe Valley is shown to be about 42 inches, and nowhere less than 30 inches. Roughly speaking, the Culm and Creedy receive an equal volume of rainfall over their basins, and the Exe three times as much as either. The four ten-year groups of the mean annual rainfall over the whole area show 107, 103, 95, and 95 per cent. of the average; with regard to this, Dr. Mill remarks that he sees no reason for supposing that there is a progressive diminution of the annual amount, though a comparatively dry spell has succeeded a comparatively wet one.

THE geological section of the Belfast Naturalists' Field Club held its first meeting of the winter session on November 24, when one of the members, Mr. James Strachan, delivered a lecture on petrological types of basalt in County Antrim. The chief portion of the lecture was devoted to a suggested rational classification of the basaltic rocks of Co. Antrim according to their varying basicity. Three main classes were recognised, and subdivided as follows:—(1) Basalts without olivine (basaltic andesites): (a) flow type, basalt of Spanish Bay, Giant's Causeway; (b) intrusive type, dolerite of the Neck at Carnmoney Hill. (2) Olivine basalts: (a) flow type, the common olivine-basalt of the district, with olivine increas-

ing from occasional grains to plentiful porphyritic crystals; (b) intrusive type, the common olivine-dolerite of the district with varying amount of olivine, e.g. dolerite of the Neck at Scawt Hill, and that of Ballygalley Head. (3) Basalts rich in olivine: (a) flow type, containing excess of olivine in large phenocrysts, minimum of felspar and augite and colourless interstitial glass; north side of Carnmoney Hill; (b) intrusive type, dolerite rich in olivine; Slieve Mish. These types of basaltic rocks were all illustrated by hand-specimens and numerous microscopic sections. In conclusion, the lecturer referred to several peculiar features of the local basalts, such as the fairly common occurrence of "tube-amygdaloid" at the basal portion of many of the Co. Antrim flows, and the complete inclusion of primary minerals, such as felspar and augite, in natrolite and other zeolites.

THE Bausch and Lomb Optical Company, 19 Thavies Inn, E.C., have submitted an improved Störmer viscosimeter for our inspection. In this apparatus a weight falling from rest causes a paddle to rotate in the oil or other liquid to be tested, and a dial registers the number of revolutions made. The time required for a given number of rotations is taken with a stop-watch; it varies with the viscosity of the liquid. Thus, when the apparatus is so adjusted that 100 revolutions in water take 12 seconds, with ether the time is 9.8 seconds, and with glycerine 36.8. The viscosities are reckoned as proportional to the time, that of water being taken as unity. To obviate "spinning" of the liquid a square receptacle is used. Some of the advantages claimed over other types of apparatus are:—(1) Only a small volume of liquid (50 c.c.) is necessary; (2) a determination is made in a few seconds, and can be easily repeated upon the same identical quantity of liquid; (3) the variation due to change of temperature during the operation is practically negligible, since the time is so short; and (4) given spare cups, a series of tests can be made without any waste of time in cleaning the instrument after each experiment. The apparatus is compact, and appears quite easy to manipulate.

THE *Verhandlungen der deutschen physikalischen Gesellschaft* for November 15 contains a critical examination, by Dr. Karl Kurz, of the theories which have been advanced to account for the existence of the penetrating radiation of the nature of  $\gamma$  rays in the atmosphere, and even in vessels hermetically sealed. There are three possible sources of this radiation. It must come either from an extra-terrestrial source, from the earth's atmosphere, or from the material of the earth itself. The author shows that the extra-terrestrial source must be excluded, owing to its leading to consequences in the upper atmosphere which are not in agreement with observations. The atmospheric source he shows to be quite inadequate, the quantity of radio-active matter present being much too small. The radio-active matter present in the soil is, however, not only sufficient to account for the radiation, but gives its intensity correctly as that necessary to produce nine or ten ions per cubic centimetre per second. The semi-diurnal period observed in the amount of radiation the author ascribes to the radio-active matter present in the atmosphere.

THE belief that areas of seismic and volcanic activity move slowly to the west is given a precise form in a paper, by Mr. H. Wehner, which appears in the *Physikalische Zeitschrift* for December 1. He assumes that within the solid crust of the earth, and separated from it by a thin layer of liquid, is a solid nucleus which rotates about the same axis as the outer shell and in the same direc-

tion, but with a velocity slightly less than that of the shell, the result being that, with respect to the shell, the nucleus makes one revolution to the west in 952 years. On this revolving nucleus the author assumes there are projecting or "active" spots which in their motion come under weak portions of the crust and cause earthquakes and volcanic disturbances. On this basis he calculates the positions of the active spots on the nucleus which have during the last sixty years produced disturbances notified by ships at sea in the tropical parts of the Atlantic. According to the calculation, these active spots are now nearly all collected under the region between longitude  $35^{\circ}$  and  $41^{\circ}$  W., and latitude  $1^{\circ}$  N. and  $1^{\circ}$  S., which should therefore be a danger zone. It will be interesting to see if further statistics support this theory.

We have received from Lu-kia-pang, China—which now serves as the magnetic observatory of the Jesuit fathers of Zi-ka-wei—an interesting copy of the record of the great magnetic storm of September 25, with some notes thereon. The storm in China was of similar duration to that experienced in this country, and presented many similar features, but the oscillations were of a much less striking character. The ranges of the declination and vertical force disturbances—about  $50'$  and  $0.002$  C.G.S. respectively—were much less than in Europe. The range in horizontal force, however, exceeded  $0.005$  C.G.S., and the excess may have been large, as the trace was off the sheet during the greater part of the storm. About three hours before the large disturbance began there was a curious little movement, seen in all the elements, which is described in the "Notes" as a precursor of the storm. We understand that movements corresponding to the supposed precursor are distinctly shown on the Kew curves, so that whether related or not to the great storm they seem to have been, like it, experienced all over the world.

THE dissociation of hydrobromic and hydriodic acids at high temperatures is the subject of a paper by K. V. v. Falckenstein in the current number of the *Zeitschrift für physikalische Chemie*. The method used is the statical one, first employed by Löwenstein, and is based on the fact that at a high temperature platinum permits the passage of hydrogen, but of no other gas. The action of the red-hot metal may be roughly regarded as a filter, the pores of which are so small that only the very small hydrogen molecules can pass through. The gaseous hydrogen compound, contained in a fused quartz tube and heated in an electric resistance furnace, passes over a platinum bulb, the inside of the latter being connected to a manometer. The pressure of the hydrogen inside the bulb is in equilibrium with the hydrogen outside the bulb arising from the dissociation. Data are given for three temperatures,  $1024^{\circ}$ ,  $1108^{\circ}$ , and  $1222^{\circ}$ , in the case of hydrobromic acid, and for two,  $1022^{\circ}$  and  $1217^{\circ}$ , for hydriodic acid. Bodenstein and Geiger have measured the E.M.F. at  $30^{\circ}$  of the cell  $\text{Br}_2\text{—HBr—H}_2$ , and Haber has deduced a formula for the relation between the amount of dissociation of the hydrobromic acid and the temperature. It is interesting to note that the dissociation calculated from this formula, in spite of the large temperature difference between  $30^{\circ}$  and  $1200^{\circ}$ , is in very fair agreement with the experimental results described in this paper.

THE sixty-sixth annual issue of the Medical Directory, for 1910, published by Messrs. J. and A. Churchill (price 14s. net), includes several new features. It appears from the numerical summary that there are 40,558 members of the medical profession, the increase from 1909 to 1910 being 566. The directory includes, for the first time, a

section on the principal British spas and climatic health resorts, by Mr. N. H. Forbes. Improvements have also been made in the list of hospitals and other institutions printed at the end of the London section of the directory.

MESSRS. CHARLES GRIFFIN AND CO., LTD., have published a sixth edition of Prof. Grenville A. J. Cole's "Aids in Practical Geology." Alterations have been made in more than a hundred places, and the subject-matter has in this way been brought up to date. While certain modern restrictions in nomenclature have been introduced, the limits of the names of rocks and fossil genera have, as in previous editions, been kept as wide as possible. Prof. Cole's book has been of signal service to very many practical geologists since its first publication in 1890, and in its latest revised form we have no doubt its sphere of usefulness will be extended.

### OUR ASTRONOMICAL COLUMN.

HALLEY'S COMET, 1909c.—As was briefly stated on p. 239 of our issue of last week, M. Deslandres has added to the large reflector at Meudon a finder, fitted with a moving reticle, which enables the instrument to be used for photographing any faint object moving in relation to the surrounding guiding stars. The aperture of the large reflector is 1 metre, the focal length 3 metres, and an exposure of five minutes, on December 6, 7, and 8, was sufficient to give a sharp image of the comet's central portion. With an hour's exposure the comet was seen, on the negative, as a nebulosity, elongated in the direction opposed to the sun. The finder now in use has an aperture of 15 cm. (6 inches) and a focal length of 2.3 metres, and may be placed on either side of the telescope to suit the convenience of the observer, a suitable counterpoise of the same form being employed on the opposite side.

In conjunction with M. Bernard, M. Deslandres also describes two spectra of the comet secured on December 6 and 8 with exposures of two hours and three hours respectively. That the comet, on December 6, was already emitting its own radiations is shown by the appearance of bright condensations at  $\lambda 388$  and  $\lambda 391.45$ , as in Morehouse's comet last year. In addition to the nearly circular nucleus, several curved rays, fainter than the nucleus and having the appearance of antennæ, were seen; from their direction it is difficult to account for these rays solely on the assumption that they are produced by solar repulsion. A spectrum taken on December 13 shows the continuous spectrum of the nucleus stronger and the condensations in the ultra-violet larger, the latter radiations evidently emanating from the nebulosity surrounding the nucleus. There is also some evidence for the oscillations of brightness observed at Greenwich (*Comptes rendus*, No. 24, December 13).

Other visual observations of the comet are recorded in No. 4377 of the *Astronomische Nachrichten*, where Prof. A. A. Iwanow also has a paper describing his calculations of the perturbations of the comet's path between 1835 and 1910. His final elements give April 23, 1910, as the probable date of perihelion passage.

AN INTERESTING SUN-SPOT.—In No. 4377 of the *Astronomische Nachrichten* M. Amaftounsky describes the changes in detail which took place in a sun-spot first seen on the sun's eastern limb on September 27 (September 15 O.S.). Six drawings which accompany the paper show how enormous were the changes, and M. Amaftounsky directs special attention to a marked yellowish-green tint which pervaded the bright tongues, or bridges, over the nucleus and the bright edges of the penumbra. This was not an optical coloration, and, according to the observer, is a very rare phenomenon.

PERIODS IN THE VARIATION OF LATITUDE.—No. 8 of the *Bulletin International de l'Académie des Sciences de Cracovie* (October, p. 543) contains a *résumé*, in French, of a memoir by M. Jan Krassowski, in which the author briefly discusses the results obtained by him in an analysis, by Schuster's "periodogram" method, of the motion of the pole. The data employed consisted of all the results